

Chalazion Laser Microsurgery: Personal Technique

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Abstract

Purpose: The aim of this paper is to investigate the usefulness of the laser beam as a hot blade to remove the chalazion while the patient is sitting with his head positioned in front of the slit-lamp microscopy.

Materials and Methods: This prospective, observational study included 3475 chalazia from 2640 patients including 1543 males and 1097 females, mean age 41,2 (11 - 90 years), who underwent surgery using laser photocoagulation with the transconjunctival approach. 356 patients had more than one chalazion. The patient's head is placed in front of the slit-lamp biomicroscope, his eyelid was fixed with a chalazion clamp and a vertical laser incision of the palpebral conjunctiva (inner chalazion) and tarsus (outer chalazion) is performed with a laser photocoagulator. The chalazion contents were curetted and removed. Patients were followed at 15 and 30 days.

Results: Fifteen days after surgery, 3426 chalazia (98.6%) were removed and patients recovered. In 49 cases (1.4%), redness and swelling of the eyelid persisted due to the presence of granuloma residues. After fifteen days of antibiotic-steroidal ointment treatment, 20 cases (0.6%) were cured, while in the other 29 cases (0.8%) their residues were completely removed with the same surgical technique. After thirty days the chalazion was not palpable in all cases.

Conclusion: This procedure is simple, fast, effective, safe and well tolerated by patients. Additionally, simultaneous hemostasis using laser photocoagulation lowers the risk of bleeding and leads to early eyelid edema resolution with an excellent cosmetic result. This technique is contraindicated in non-cooperative patients requiring anesthesiological assistance.

Keywords: Chalazion; Meibomian Gland; Eyelid; Laser Photocoagulation; Microsurgery

Introduction

The meibomian glands, present within the tarsus, produce oily fluid which is part of the tear film. A chalazion is an acute lipogranulomatous inflammation which is usually caused by plugged meibomian gland ducts and frequently becomes chronic. Individuals of all ages, including children, are susceptible to this most common eyelid disease [1]. Earlier research has shown that patients who suffer from meibomian gland dysfunction, conditions affecting periocular skin and tear film, ocular rosacea and chronic blepharokeratoconjunctivitis have a greater chalazion incidence as well as a recurrence frequency [1-3]. This is due to the fact that these patients have suffered from poor meibomian gland function for an extended period of time, which resultantly changes the glands morphological characteristics. Initially, a chalazion is self-limiting with the ability to be resolved or enhanced by medical therapy throughout 1 - 3 months of onset. However, sometimes the lesion becomes persistent and prominent requiring a surgical solution. A variety of treatment methods are available, including eyelid hygiene, antibiotic ophthalmic ointments, steroid injection, lesion excision with curettage, and total excision [4-6]. In

addition, there are some other experimented methods such as injection of botulinum toxin A, tarsal trephination, removal of chalazion by application of CO₂ laser or cryogenic action, diathermy thermocoagulation, intense pulse light therapy with meibomian gland expression [7-10]. However, there is currently no commonly agreed treatment of choice. The treatments of excision and curettage are believed to be straightforward and successful. However, they can produce discomfort in the eyelid [11]. A primary and recurrent chalazion may cause cosmetic disfigurement to the eyelid, ocular inflammation together with irritation, and possibly even visual impairment due to mechanical ptosis and corneal astigmatism [10]. Patients with recurrent and refractory chalazia have increased risks of depression, anxiety, and decreased quality of life [8]. This is the first surgical technique, to my knowledge, which uses the beam of a laser photocoagulator (532 nm) as a hot blade to inside the eyelid and remove the chalazion while the patient is sitting with his head positioned in front of the slit-lamp microscopy. The goal of this technique is to reduce the time and cost of surgery, healing and discomfort of patients.

Materials and Methods

This prospective, observational study included 2640 patients and 3475 chalazia (1642 upper and 1833 lower chalazia) in the period from January 2010 to December 2023. Participants including 1543 males and 1097 females, mean age 41,2 (11 - 90 years) with chalazia from at least two weeks accompanied by pain and erythema, and that did not respond to conservative therapies including antibiotic ophthalmic ointments. 356 patients had more than one chalazion. Before treatment, patient histories were taken including age, gender, duration of the chalazion, number of chalazia, number of previous incisions with curettage surgery and eyelid margin abnormality of vascular engorgement. The characteristics of the chalazion, including its location and size, hyperemia, meibum quantity and grade were determined using slit-lamp microscopy. It was not necessary to suspend the anticoagulant or antiplatelet drugs that some patients regularly took. Exclusion factors were ocular infection, allergy, intraocular phlogosis and non-cooperative patients. Written general consent was obtained in which the patients (or their tutor in case of underage) agree with this surgical technique. It has been evaluated by Ethics Committee of Igea Private Hospital (Milan, Italy) and deemed not to require ethics approval. Additionally, written informed consent for publication of identifiable face photo was obtained from the patient shown in the figure. After subcutaneous injections of local anesthesia using 2% lidocaine, the patient's head is placed in front of the slit-lamp biomicroscope with the eye protected by a drop of hydroxypropylmethylcellulose (Gel 4000, Bruschettini s.r.l. Genova, Italy) and rotated away from the direction of the laser beam (Figure 1). All the chalazia were removed via the transconjunctival approach [12,13]. The eyelid was fixed with a Lambert or Hunt chalazion clamp on the desired location and the tarsal conjunctiva is dried with an eye spear. After setting the laser power (1 watt in continuous wave) and diameter of the spot (100 µm), a vertical laser incision of the palpebral conjunctiva (inner chalazion) and tarsus (outer chalazion) of 2-3 mm in length is performed with a Neodymium-doped Yttrium Aluminum Garnet Laser (Alcon Ophthalas 532 EyeLite Laser Photocoagulator). The chalazion contents were completely curetted with a Meyhoefer spoon (1, 2 or 3 mm diameter, based on location and size of granuloma). Finally, the eye was washed with cold balanced saline solution (BSS), medicated with Betamethasone 1 mg/g + Chloramphenicol 2.5 mg/g ophthalmic gel drops and bandaged for one hour. In some patients the multiple chalazia were removed in a single session. Patients were followed at 15 and 30 days.



Figure 1: The patient's head is placed in front of the slit-lamp biomicroscope. After a laser incision, the chalazion contents are curetted and removed.

Result and Discussion

Fifteen days after surgery, 3426 chalazia (98.6%) were removed and patients recovered. In 49 cases (1.4%), redness and swelling of the eyelid persisted due to the presence of granuloma residues. After fifteen days of antibiotic-steroidal ointment treatment, 20 cases (0.6%) were cured, while in the other 29 cases (0.8%) their residues were completely removed with the same surgical technique. This complication was due to the initial learning curve. After thirty days the chalazion was not palpable in all cases. The benefits of this technique include the use of small surgical instruments, simplicity, rapid execution, excellent visualization of the lesion, small incision, absence sutures. Additionally, simultaneous hemostasis using laser photocoagulation lowers the risk of bleeding and leads to early eyelid edema resolution with an excellent cosmetic result. It is very useful for treating multiple, small chalazia near the lacrimal punctum or lid margin where traditional surgery may result in permanent functional and aesthetic defects.

Conclusion

This laser procedure is simple, fast, safe, effective and well tolerated by patients. Attention should be paid to the possible occurrence of lipothymia in emotional patients. This technique is contraindicated in non-cooperative patients requiring anesthesiological assistance. Finally, all patients were satisfied and those who in the past had been operated with the surgical traditional technique preferred this method.

Conflict of Interest

The author declares that he has no conflict of interest.

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